WESTON DESIGNERS CONSULTANTS

BY GMC DATE 10/10/85 DIV _____ SHEET _____ OF _____

CHKD BY _____ DATE _____ DEPT _____ W.O. NO. _____

PROJECT Jasper Co. HRS

SUBJECT TCR

Site: _____
ID #: _____
Break: _____
Other: _____

Missouri Dept. of Natural Resources
Div. of Geology and Land Survey

Michael C. McFarland 314/364-1752

Has 1982 Report by Missouri State Highway Dept. which describes the location, quantity of tailings piles in the Joplin area and other mining areas in Missouri. He will pull sections which specifically apply to the Joplin area, photocopy and send via overnite mail

Received package Federal Express on morning of 10/11/85.

0736
Site: ORONOGO
ID #: MOD980686981
Break: 1.6
Other:
10/10/85 JV

40114631

SUPERFUND RECORDS

RFW 338-5-81

MISSOURI COOPERATIVE HIGHWAY RESEARCH PROGRAM
FINAL REPORT

81-2

Distance

WASTE PRODUCTS IN MISSOURI WITH POTENTIAL HIGHWAY APPLICATION

MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT

WASTE PRODUCTS IN MISSOURI WITH POTENTIAL HIGHWAY APPLICATION

Material and Research
Bob Wilbert

FINAL REPORT

417/623 5794

STUDY NO. 81-2

Prepared By

MISSOURI HIGHWAY AND TRANSPORTATION DEPARTMENT

DIVISION OF MATERIALS AND RESEARCH

Division of Planning, Construction
Office of Administration
314/751 3339

APRIL, 1982

W. L. Trimm
Local Public Agency Liaison Engineer
314/364 3839

In Cooperation With

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

ABSTRACT

A statewide survey to locate solid waste products having potential for highway applications was conducted during 1981. The survey inventory includes 305 separate entries representing some 80 million tons of waste material currently accumulating at an annual rate of about 5 million tons.

Due to the State being a prime source of metal ore mining and smeltering, vast tonnages of mine tailings have accumulated. Also, considerable tonnages of electric utility waste products continue to accumulate in the form of fly ash, dry bottom boiler ash, and wet bottom boiler slag.

Possible uses for each waste material product are cited. From the summarized inventory, certain waste products were selected that appear to warrant further evaluation.

scalping operation of gravel taken from both pits and streams. Physical characteristics include a material that is tan to brown in color, individual particles are generally rounded due to stream action, and is generally a clean hard durable material ranging in size from a plus 2 inch to a minus 8 inch. These waste oversized gravel piles were reported by Districts 6 and 8. Several of these stockpile sites are now abandoned after former active highway projects were completed. Due to its hardness, it has not been economically feasible to crush this chert gravel with the present technology and methods available. Possible uses of this waste product would be as embankment fill material and in gabions as is, and as aggregate for bituminous surface courses with crushing and sizing.

V. Railroad Ballast Rock - This waste product is presently represented by an abandoned railroad bed extending some 62 miles and is located in the east central section of the State comprising some 230,000 cubic yards of material. It is generally made up of durable rock particles placed in layers of minus 2 1/2 inch material made up from both igneous and sedimentary rock types. Possible uses of this waste product would be as an aggregate for base, embankment fill, and shoulder material.

Category X - Miscellaneous

I. Boulders and Chat Piles Mixed (Joplin Area) - This waste is a by-product of former metal mining operations. Boulders of the Joplin area are also chert remnants wasted from lead and zinc mining. While most are approximately

12 inches in top size there is considerable variation in the degree of size uniformity from pile to pile. In most cases, graded chat has been wasted with these boulders in a common stockpile. These Joplin "flint" chats are mostly jasperoid and chert, both forms of silica. Possible uses of this waste product would be as base, embankment fill, shoulder material, and in gabions.

II. Digested Sludge - This waste is a by-product of a municipal sewage treatment plant. Digested sludge is a black, thin, mud-like, pumpable liquid which may contain 5 to 6 percent of organic solids and is fairly odor-free. It has been used in small quantities as a liquid fertilizer.

see table for notes

III. Gypsum - This waste is a by-product in the manufacture of phosphate fertilizer. Physical characteristics include a material that is a dull white to light gray in color and is silty textured. It is chemically similar to natural gypsum. It is stored in drained stockpiles in loose to poorly cemented form. At the present time, there are no known highway uses for this particular waste product.

IV. Limestone Screenings - This waste is a by-product from the production of crushed aggregate and is a remnant of a screening operation following a secondary crusher. Physical characteristics include a material that is generally grayish in color and a gradation having 100% passing the 3/8 inch sieve with about 8% passing the No. 200 sieve. This waste would be considered chemically inert. These screenings are commonly found at most quarry sites whether active or abandoned. A lime

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
Category IX - Oversized and/or Undersized Gravel and Sand (Continued)						
IV. Oversized Gravel (10)						
Meramec Materials Company	1/2 Mile East of Pacific [96]	Dry	Yes	4,000 Tons	1,000 Tons	III
Monroe Mount	2 Miles West of Leadwood [110]	Dry	Yes	102,000 Yds.^{3}	None	III
Andy Andersen	3 Miles South of Devils Elbow [85]	Dry	Yes	90,000 Yds.^{3}	None	III
Bill May	4 Miles Southwest of Bradleyville [106]	Dry	Yes	40,000 Tons	None	III
Howard Ready-Mix Concrete Company	4 Miles North of St. Roberts [85]	Dry	Yes	15,000 Tons	8,000 Tons	III
V. Railroad Ballast Rock						
Burlington Northern Railroad	Mexico to Old Monroe (Abandoned) [4,70,57] (Appr. 62 Miles)	Dry	Yes	230,000 Yds.^{3}	None	II
Category X - Miscellaneous Material						
I. Boulders and Chat Piles Mixed (Joplin Area)						
Independent Gravel Company	1 Mile North of Webb City [49]	Dry	Yes	11,000 Tons	None	II
Independent Gravel Company	1 Mile North of Webb City [49]	Dry	Yes	75,000 Tons	None	II
Independent Gravel Company	At the North Edge of Webb City [49]	Dry	Yes	97,000 Tons	None	II
Independent Gravel Company	At Northeast Edge of Webb City [49]	Dry	Yes	130,000 Tons	None	II
Independent Gravel Company	1/2 Mile East of Webb City [49]	Dry	Yes	592,000 Tons	None	II

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
			Category X - Miscellaneous Material (Continued)			
Independent Gravel Company	1/2 Mile East of Webb City [49]	Dry	Yes	324,000 Tons	None	II
Independent Gravel Company	2 Miles Northwest of Duenweg [49]	Dry	Yes	95,000 Tons	None	II
Independent Gravel Company	2 Miles North of Webb City [49]	Dry	Yes	7,000 Tons	None	II
Barton County Truckers Association	2 Miles Northwest of Purcell [49]	Dry	Yes	20,000 Tons	None	II
Barton County Truckers Association	2 Miles Northwest of Purcell [49]	Dry	Yes	45,000 Tons	None	II
Brown and Root, Inc.	1/2 Mile South of Carterville [49]	Dry	Yes	95,000 Tons	None	II
Charles Smith	2 Miles West of Joplin [49]	Dry	Yes	3,500 Tons	None	II
Steve Smith	3 Miles Southwest of Carl Junction [49]	Dry	Yes	4,000 Tons	None	II
B. E. Phillips	4 Miles Northwest of Joplin [49]	Dry	Yes	4,500 Tons	None	II
Bank of Jasper	1 Mile South of Carl Junction [49]	Dry	Yes	38,000 Tons	None	II
Not Available At This Time	3 Miles West of Joplin [49]	Dry	Yes	10,000 Tons	None	II
II. Digested Sludge						
Kansas City Pollution Control	Platte Woods [83]	Wet	Yes	None	832,000 Gal.	III
III. Gypsum						
Farmers Chemical Company	3 Miles West of Joplin [49]	Dry	Yes	2,000,000 Tons	None	III

deposited on (or adjacent to) Zn-Pb mine areas

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
	Category X - Miscellaneous Material (Continued)					
W. R. Grace and Company	1/2 Mile Northeast of Duenweg [49]	Dry	Yes	2,800,000 Tons	None	III
	deposited on (or adjacent to) Zn - Pb mine areas					
IV. Limestone Screenings (11)						
Francis Blair	3 Miles Northwest of Barnard [74]	Dry	Yes	2,000 Tons	None	II
Ed Froman	4 Miles Northwest of Gallatin [31]	Dry	Yes	10,000 Tons	None	II
Hardrock Quarries	2.5 Miles East of Ridgeway [41]	Dry	Yes	2,000 Tons	None	II
Lloyd Manville	3 Miles Northeast of Blue Ridge [41]	Dry	Yes (In Dry Weather)	2,000 Tons	None	II
Sam Parker	5 Miles South of Cameron [25]	Dry	Yes	650 Tons	None	II
E. I. Sargents Quarries, Inc.	6 Miles North of Allendale [113]	Dry	Yes	2,500 Tons	None	II
Darrell Wilson	3.5 Miles Southeast of Agency [11]	Dry	Yes	12,500 Tons	None	II
Maynard Vaughn	2.25 Miles Southeast of Maysville [32]	Dry	Yes	1,500 Tons	None	II
Mississippi Lime Company	Ste. Genevieve [95]	Dry	Yes	3,000,000 Tons	250,000 Tons	II
V. Mixture of Grit, Sand, Gravel, Organic Material and Metal						
Kansas City Pollution Control	Kansas City [48]	Dry	Yes	None	2,000 Yds.^{3}	III
VI. Quarry Overburden as Soil, Shale and Limestone Boulders or Rip Rap Material (12)						

whose process is such that its slag, at present, is considered a hazardous waste. With this exception, lead blast furnace slag is being used as aggregate in bituminous mixtures and possible uses as a snow and ice abrasive material or as porous fill material.

Category VI - Various Mine Tailings

I. Graded Chat Piles (Joplin Area) - This waste is a by-product of former metal mining operations. Physical characteristics include material that is grayish white in color and angular particles shapes. It is moderately well graded with 100% passing a 1/2 inch sieve with only minor amounts passing the No. 200 sieve. This material consists of chert fragments, residual from the mining and processing of lead and zinc ores, primarily from the Reeds Spring and Grand Falls formations. This material is currently being used as aggregate in bituminous mixtures and with processing is being used as abrasives for blast cleaning bridge steel. Possible uses of this waste product are as embankment fill material or as subbase material.

II. Remains of Graded Chat Piles (Joplin Area) - This waste is a by-product of former metal mining operations. This is essentially the same material as above and consists of remnants (stockpile bases) remaining on the ground where large chat piles have been depleted as well as any oversized material (typically as plus 1/2 inch sieve) remnant from past screening or scalping operations. Possible uses of this waste product would be as embankment fill material and as subbase material.

III. Lead Mine Chat Tailings (Flat River Area) - This waste is a by-product of generally former metal mining operations

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
Category V - Metallurgical Slags (Continued)						
III. Lead Blast Furnace Slag						
St. Joe Lead Company	Herculaneum [50]	Dry	Yes	2,000,000 Tons	75,000 Tons	III
Asarco Mining Company	Glover [47]	Dry	Yes	1,000,000 Tons (5)	None	III
Category VI - Various Mine Tailings						
I. Graded Chat Piles (Joplin Area)						
Independent Gravel Company	2 Miles West of Wentworth [73]	Dry	Yes	70,000 Tons	None	I
Vance Bros., Inc.	2 Miles South of Carterville [49]	Dry	Yes	1,050,000 Tons	None	I
C. E. Simon	1/2 Mile West of Duenweg [49]	Dry	Yes	32,000 Tons	None	I
Ray Sharp	2 Miles South of Carterville [49]	Dry	Yes	152,000 Tons	None	I
Keith Nolan	1/2 Mile West of Prosperity [49]	Dry	Yes	1,700,000 Tons	None	I
Allan McReynolds	1 Mile Northwest of Duenweg [49]	Dry	Yes	75,000 Tons	None	I
II. Remains of Graded Chat Piles (Joplin Area)						
Independent Gravel Company	2 Miles North of Webb City [49]	Dry	Yes	19,000 Tons	None	II
Independent Gravel Company	1 Mile North of Webb City [49]	Dry	Yes	340,000 Tons	None	II
Independent Gravel Company	At North Edge of Webb City [49]	Dry	Yes	46,000 Tons	None	II
Independent Gravel Company	At Northeast Edge of Webb City [49]	Dry	Yes	33,000 Tons	None	II

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
	Category VI - Various Mine Tailings (Continued)					
Independent Gravel Company	1/2 Mile East of Webb City [49]	Dry	Yes	402,000 Tons	None	II
Independent Gravel Company	1/2 Mile East of Webb City [49]	Dry	Yes	349,000 Tons	None	II
Independent Gravel Company	1 Mile North of Webb City [49]	Dry	Yes	50,000 Tons	None	II
West 7th Street Salvage, Inc.	1 Mile West of Joplin [49]	Dry	Yes	30,000 Tons	None	II
Vance Bros., Inc.	2 Miles South of Carterville [49]	Dry	Yes	50,000 Tons	None	II
J. G. Mitchell	1 Mile East of Spring City [73]	Dry	Yes	85,000 Tons	None	II
Vance Bros., Inc.	2 Miles South of Carterville [49]	Dry	Yes	150,000 Tons	None	II
Vance Bros., Inc.	2 Miles South of Carterville [49]	Dry	Yes	5,000 Tons	None	II
Allan McReynolds	1 Mile Northwest of Duenweg [49]	Dry	Yes	100,000 Tons	None	II
Bell Egg Farm	2 Miles Northwest of Duenweg [49]	Dry	Yes	60,000 Tons	None	II
C. E. Simon	1/2 Mile West of Duenweg [49]	Dry	Yes	4,000 Tons	None	II
Keith Nolan	1/2 Mile West of Prosperity [49]	Dry	Yes	150,000 Tons	None	II
Keith Nolan	1/2 Mile West of Prosperity [49]	Dry	Yes	300,000 Tons	None	II
Keith Nolan	1 Mile West of Prosperity [49]	Dry	Yes	8,000 Tons	None	II
Keith Nolan	1 Mile West of Prosperity [49]	Dry	Yes	100,000 Tons	None	II

Table I (Continued)

Company	Where Stored (In Missouri) (1)	How Stored	Access Road Yes/No	Estimated Present Quantity Available	Estimated Annual Rate of Accumulation	Product Type Rating
	Category VI - Various Mine Tailings (Continued)					
Carl McDonald	1/2 Mile South of Carterville [49]	Dry	Yes	1,100,000 Tons	None	II
Paul Fitzer	4 Miles West of Joplin [49]	Dry	Yes	2,500 Tons	None	II
Allan McReynolds	1 Mile Northwest of Duenweg [49]	Dry	Yes	175,000 Tons	None	II
Keitn Nolan	1 Mile West of Prosperity [49]	Dry	Yes	61,000 Tons	None	II
Carl McDonald	1/2 Mile South of Carterville [49]	Dry	Yes	660,500 Tons	None	II
Brown and Root, Inc.	1/2 Mile South of Carterville [49]	Dry	Yes	36,000 Tons	None	II
Louis McDonald	Oronogo [49]	Dry	Yes	500,000 Tons	None	II
Steve Smith	3 Miles Southwest of Carl Junction [49]	Dry	Yes	12,000 Tons	None	II
Not Available at this Time	3 Miles West of Joplin [49]	Dry	Yes	15,000 Tons	None	II
Keith Nolan	1/2 Mile West of Prosperity [49]	Dry	Yes	190,000 Tons	None	II
C. E. Simon	1/2 Mile West of Duenweg [49]	Dry	Yes	72,000 Tons	None	II
III. Lead Mine Chat Tailings (Flat River Area)						
James Allen Materials, Inc.	1/4 Mile North of Desloge [94]	Dry	Yes	3,000,000 Tons	None	I
St. Joe Minerals Corporation	North City Limits of Bonne Terre [94]	Dry	Yes	3,000,000 Tons	None	I
St. Joe Minerals Corporation	Flat River [94]	Dry	Yes	6,000,000 Tons	None	I